

STTH30L06C

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

Table 1: Main Product Characteristics

I _{F(AV)}	Up to 2 x 20 A
V _{RRM}	600 V
T _j	175°C
V _F (typ)	0.95 V
t _{rr} (max)	55 ns

FEATURES AND BENEFITS

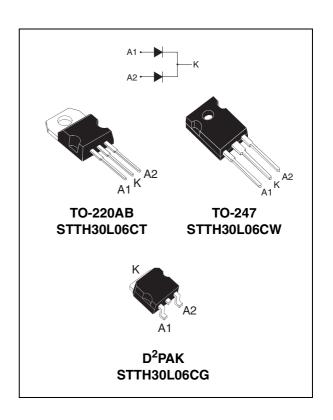
- Ultrafast switching
- Low reverse current
- Low thermal resistance
- Reduces switching & conduction losses

DESCRIPTION

The STTH30L06, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, and industrial applications, as rectification and discontinuous mode PFC boost diode.

Table 2: Order Codes

Part Number	Marking
STTH30L06CT	STTH30L06CT
STTH30L06CW	STTH30L06CW



Part Number	Marking
STTH30L06CG	STTH30L06CG
STTH30L06GG-TR	STTH30L06CG

Table 3: Absolute Ratings (limiting values, per diode)

Symbol	Parameter	Parameter					
V _{RRM}	Repetitive peak reverse voltage		600	V			
I _{F(RMS)}	RMS forward voltage			30	Α		
I _{F(AV)}	Average forward current	Tc = 140°C	Per diode	15	Α		
, ,	$\delta = 0.5$	Tc = 125°C	Per device	30			
		Tc = 120°C	Per diode	20			
		Tc = 110°C	Per device	40			
I _{FSM}	Surge non repetitive forward current	tp = 10ms si	nusoidal	130	Α		
T _{stg}	Storage temperature range			-65 to + 175	°C		
T _j	Maximum operating junction temperature			175	°C		

Table 4: Thermal Resistance

Symbol	Parameter	Value (max).	Unit	
R _{th(j-c)}	Junction to case	Per diode	1.7	°C/W
		Total	1.15	
R _{th(c)}	Coupling		0.6	°C/W

Table 5: Static Electrical Characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Тур	Max.	Unit
I _R *	Reverse leakage current	T _j = 25°C	$V_R = V_{RRM}$			15	μΑ
		T _j = 150°C	•		40	400	
V _F **	Forward voltage drop	T _j = 25°C	I _F = 15A			1.55	V
		T _j = 150°C			0.95	1.2	
		T _j = 25°C	I _F = 30A			1.76	
		T _j = 150°C			1.15	1.45	

Pulse test:

To evaluate the conduction losses use the following equation: $P = 0.94 \times I_{F(AV)} + 0.017 I_{F}^{2}(RMS)$

Table 6: Dynamic Characteristics (per diode)

Symbol	Parameter		Test conditions	Min.	Тур	Max.	Unit
t _{rr}	Reverse recovery	T _j = 25°C	$I_F = 0.5A$ $Irr = 0.25A$ $I_R = 1A$			55	ns
	time		$I_F = 1A$ $dI_F/dt = 50 A/\mu s$ $V_R = 30V$		60	85	
I _{RM}	Reverse recovery current	,	$I_F = 15A$ $V_R = 400V$ $dI_F/dt = 100 A/\mu s$		8.5	12	Α
t _{fr}	Forward recovery time	T _j = 25°C	$I_F = 15A$ $dI_F/dt = 100 A/\mu s$ $V_{FR} = 1.1 \times V_{Fmax}$			300	ns
V _{FP}	Forward recovery voltage	T _j = 25°C	$I_F = 15A$ $dI_F/dt = 100 A/\mu s$ $V_{FR} = 1.1 \times V_{Fmax}$		3.0		V

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When the diodes 1 and 2 are used simultaneously: $\Delta \text{ Tj(diode 1)} = \text{P(diode 1)} \times \text{R}_{th(j-c)}(\text{Per diode}) + \text{P(diode 2)} \times \text{R}_{th(c)}$

^{*} tp = 5 ms, δ < 2%

^{**} tp = 380 µs, δ < 2%

Figure 1: Conduction losses versus average forward current (per diode)

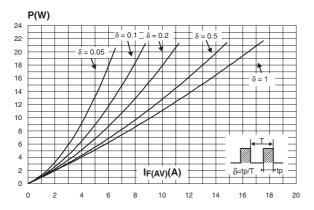


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration

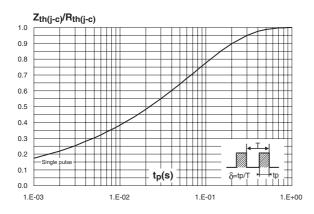


Figure 5: Reverse recovery time versus dI_F/dt (typical values, per diode)

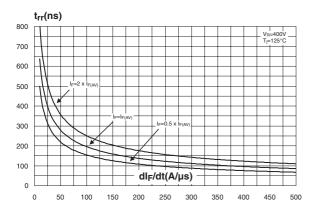


Figure 2: Forward voltage drop versus forward current (per diode)

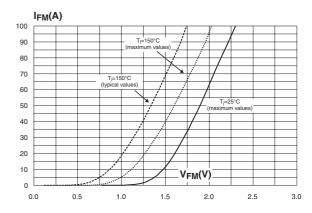


Figure 4: Peak reverse recovery current versus dl_F/dt (typical values, per diode)

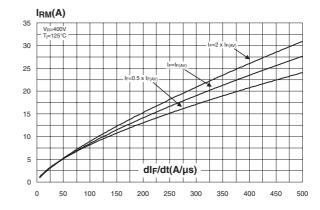
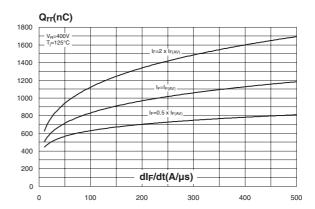


Figure 6: Reverse recovery charges versus dl_F/dt (typical values, per diode)



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Figure 7: Reverse recovery softness factor versus dl_F/dt (typical values, per diode)

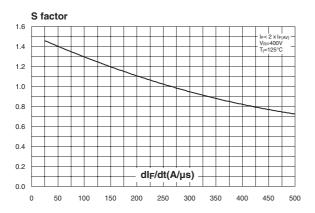


Figure 9: Transient peak forward voltage versus dl_F/dt (typical values, per diode)

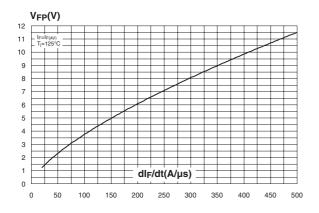


Figure 11: Junction capacitance versus reverse voltage applied (typical values, per diode)

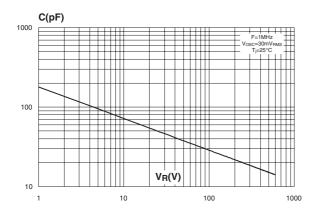


Figure 8: Relative variations of dynamic parameters versus junction temperature

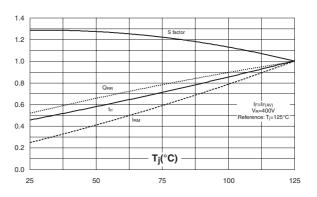


Figure 10: Forward recovery time versus dl_F/dt (typical values, per diode)

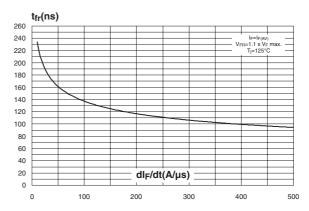
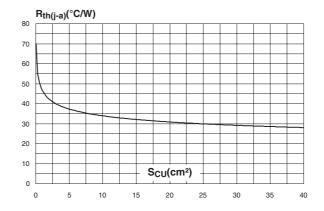
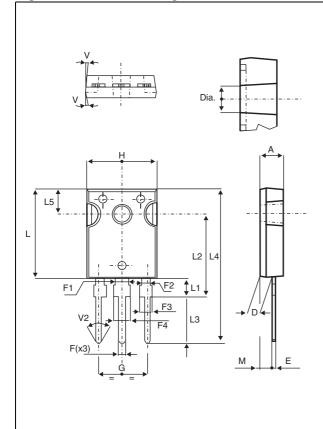


Figure 12: Thermal resistance junction to ambient versus copper surface under tab (epoxy FR4, e_{CU}=35µm) (D²PAK)



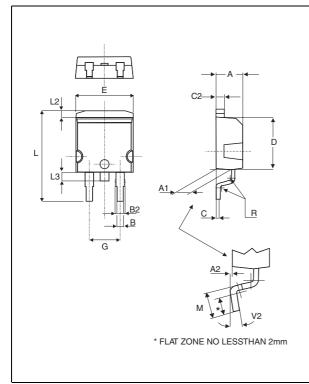
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Figure 13: TO-247 Package Mechanical Data



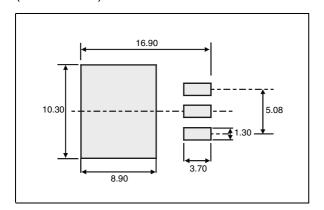
		DIMENSIONS				
REF.	Mi	llimete	ers		Inches	;
	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
Е	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
Н	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
М	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

Figure 14: D²PAK Package Mechanical Data



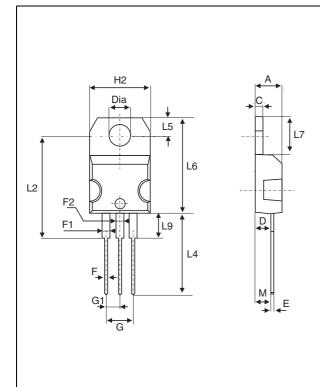
		DIMEN	ISIONS	
REF.	Millimeters		Inc	hes
	Min.	Max.	Min.	Max.
Α	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
В	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
С	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
Е	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
М	2.40	3.20	0.094	0.126
R	0.40	typ.	0.016	6 typ.
V2	0°	8°	0°	8°

Figure 15: D²PAK Foot Print Dimensions (in millimeters)



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Figure 16: TO-220AB Package Mechanical Data



		DIMEN	ISIONS		
REF.	Millimeters		Inc	hes	
	Min.	Max.	Min.	Max.	
Α	4.40	4.60	0.173	0.181	
С	1.23	1.32	0.048	0.051	
D	2.40	2.72	0.094	0.107	
Е	0.49	0.70	0.019	0.027	
F	0.61	0.88	0.024	0.034	
F1	1.14	1.70	0.044	0.066	
F2	1.14	1.70	0.044	0.066	
G	4.95	5.15	0.194	0.202	
G1	2.40	2.70	0.094	0.106	
H2	10	10.40	0.393	0.409	
L2	16.4	typ.	0.645 typ.		
L4	13	14	0.511	0.551	
L5	2.65	2.95	0.104	0.116	
L6	15.25	15.75	0.600	0.620	
L7	6.20	6.60	0.244	0.259	
L9	3.50	3.93	0.137	0.154	
М	2.6	typ.	0.102	2 typ.	
Diam.	3.75	3.85	0.147	0.151	

Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH30L06CT	STTH30L06CT	TO-220AB	2.23 g	50	Tube
STTH30L06CG	STTH30L06CG	D ² PAK	1.48 g	50	Tube
STTH30L06CG-TR	STTH30L06CG	D ² PAK	1.48 g	1000	Tape & eel
STTH30L06CW	STTH30L06CW	TO-247	4.46 g	50	Tube

- Epoxy meets UL94, V0
 Cooling method: by conduction (C)
 Recommended torque value: 0.8 m.N. (TO-220FPAC) / 0.55 m.N. (TO-220AB)
 Maximum torque value: 1.0 m.N. (TO-220FPAC) / 0.70 m.N. (TO-220AB)

Table 8: Revision History

Date	Revision	Description of Changes
07-Sep-2004	1	First issue

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